Mr. Hill (late assistant to Prof. Davidson), which leaves Mr. Keeler free to make the necessary studies of the great star spectroscope, which is one of the most important accessories of the 36-inch equatorial. Mr. Barnard is assiduously observing comets and nebulæ with the fine 12-inch equatorial, and getting the photographic appliances in readiness to be used with the great telescope. He has already discovered twenty new nebulæ, found in the course of his sweeps for new comets. To show you some of the advantages of our situation here, I may tell you that Prof. Swift, of Rochester, has a fine 16-inch equatorial by Alvan Clark, and has discovered many faint nebulæ by its use. Two nights ago Mr. Barnard was examining some of these excessively faint objects by means of the 12-inch telescope (which gives only a little more than half the light of Prof. Swift's), and in the field of view where Prof. Swift had mapped only one nebula Mr. Barnard found three, two being, of course, new. This is due not only to the observer's skill and keenness of eye, but in great measure to the purity and transparency of our atmosphere here.

"The Eastern astronomers have given up the observation of Olbers's comet, which is now only about 7/100 as bright as last year, but Mr. Barnard has succeeded in following it up to last night, when it finally became too faint to be seen even here. These observations, which are several weeks later than those of other Observatories, are of real value, as they determine a larger arc of the comet's orbit, and enable its motion to be fixed with a much higher degree of accuracy. Mr. Keeler is just reducing his observations of the faint satellites of Mars, made with the large telescope during the past months. You can gain some sort of an idea of the immense advantage of the great telescope in such observations, when I tell you that the brightness of the satellites as observed by him was only about one-sixth of their brightness at the time of their discovery. We can, then, make satisfactory observations of objects which are *six times fainter* than those very minute satellites of Mars were when Prof. Hall discovered them in 1877 with the great telescope at Washington. I am becoming familiar with the performance of the large telescope and learning how to get the very best work from it. It needs peculiar conditions; but when all the conditions are favourable its performance is superb. I am, as you know, familiar with the action of large telescopes, having observed for many years with the great refractor at Washington, but I confess I was not prepared for the truly magnificent action of this, the greatest of all telescopes, under the best conditions. I have had such views of the bright planets (Mars and Jupiter), of nebulæ, the Milky Way, and some of the stars, as no other astronomer ever before had. Jupiter, especially, is wonderfully full of detail that I had not begun to see before. The disks of his moons can be readily noted in smaller telescopes; but here they are full and round, like those of planets. I am almost of the opinion that the curve of Jupiter's shadow might be seen on the surfaces, under favourable circumstances, when the satellites suffer eclipse. There is reason to believe that the satellites of Jupiter, like our own moon, present always the same face to their planet. This can be studied here to great advantage if the disks present any of the markings which are reported by other observers.

"The Milky Way is a wonderful sight, and I have been much interested to see that there is, even with our superlative power, no final resolution of its finer parts into stars. There is always the background of unresolved nebulosity on which hundreds and thousands of stars are studded—each a bright, sharp, separate point. The famous cluster in Hercules (where Messier declared he saw 'no star') is one mass of separate individual points. The central glow of nebulosity is thoroughly separated into points. I have been specially interested in looking at objects which are familiar to me in other telescopes and in comparing our views with the drawings made by Lord Rosse with his giant 6 foot reflector. Theoretically, his telescope should show more than ours, for his collected the most light. But the *definition* (sharpness) of his is far behind our own, as we constantly see. For example, the ring nebula in Lyra is drawn by Lord Rosse with no central star. At Washington, one small star can be seen in the midst of the central vacuity, but here we are sure of seeing three such at least. These are interesting on account of their critical situation in the nebula, not simply as stars.

"The great Trifid and Omega nebulæ are wonderful objects here. Not only is a vast amount of detail seen here which cannot be seen elsewhere, but the whole aspect of them is changed. Many points that are doubtful with other telescopes are perfectly simple and clear here. I have always considered that one of the great practical triumphs of this telescope would be to settle, once for all, the doubts that have arisen and that will arise elsewhere. Now, I am sure that we shall be able to do this, and in a way to end controversy.

"Of course you understand that the period of construction here is not yet quite over, though, I am thankful to say, it is nearly ended. We have been making our observations, so far, under great disadvantages, and now that we see the way out of most of them, and look forward to work uninterrupted by machinists and constructors, we begin to realize the opportunity. It really takes time to understand how to utilize it in the very best way. A great telescope is not like an opera-glass, which can be taken out of one's pocket, and which is at once ready for use. It is a delicate and a complicated machine, which demands a whole set of favourable conditions for its successful use. Every one of these conditions has to be studied and understood, so that it can be commanded and maintained. We have been busy night and day in this work, and in completing the thousand arrangements and contrivances which are essential in order to turn this vast establishment from a museum of idle instruments into a busy laboratory, where the inner secrets of the sky are to be studied. We feel sure now that in a comparatively short period we shall be in full activity. In the meantime every one of us is doing his best under the conditions.

"We expect to open the Observatory to visitors every Saturday night from 7 to 10 o'clock, beginning next Saturday, July 14.

"EDWARD S. HOLDEN."

SCIENTIFIC SERIALS.

Studies from the Biological Laboratory of Johns Hopkins University, vol. iv. No. 4, June 1888.—On the life-history of *Epenthesis mccraydi* (n. sp.), by W. K. Brooks, Ph.D. (plates 13-15). In June 1887, Dr. Brooks found at Nassau, in the Bahamas, a few specimens of a Hydromedusa belonging to the Eucopidæ, bearing upon each one of its four reproductive organs a number of Hydroid blastostyles from which young Medusæ were produced by budding; a method of reproduction which has no parallel among the Hydroids, if, indeed, it occurs elsewhere in the animal kingdom. While in their endless diversity the Hydromedusæ present nearly all imaginable phases of development, yet in all hitherto recorded cases the life-history of each species from the egg to the second generation of eggs is a history of progression, but this Nassau Medusa is an exception to the general rule; the bodies which are carried on the reproductive organs of the Medusa are true blastostyles, so that there is a recapitulation of larval stages without sexual reproduction. This remarkable form had on its first discovery been referred to Oceania, but is really an Epenthesis. The Medusæ carry on their reproductive organs campanularian Hydroid blastostyles, inclosed in chitinous gonangia. These blastostyles do not multiply by budding or from Hydroid cormi, although they produce Medusæ by budding. The ectoderm of the blastostyle is produced by ordinary gemmation, and is directly continuous with the ectoderm of the Medusa, but its endoderm has no direct communication with the medusal endoderm, its germ-cells arising by the process termed sporogenesis by Metschnickoff.—Observations on the development of Cephalopods: homology of the germ-layers, by S. Watase (plates 16 and 17). In this most important paper the history of the formation of the germ-layers is traced, and many disputed points are settled.—On the development of the Eustachian tube, middle ear, tympanic membrane, and meatus of the chick, by Dr. F. Mall (plates 18 and 19). Confirms Prof. His's demonstration, controverted by Fol and others, that the branchial clefts are not fissures.—On the branchial clefts of the dog, with special reference to the origin of the thymus gland, by Dr. F. Mall (plates 19-21).—On experiments with chitin solvents, by T. H. Morgan. Recommends the Labaraque solution (potassium hyperchlorite) as a solvent for chitin.

Notes from the Leyden Museum, vol. x. No. 3, July 1888.—Among the longer articles may be mentioned:—On the Erotylidæ of the Leyden Museum, by the Rev. H. S. Gorham. About seventeen are new, including four for which it has been necessary to make new genera.—On some new Phytophagous Coleoptera from Brazil, by M. Jacoby.—On the Shrews of the Malayan Archipelago, by Dr. F. A. Jentink.—On the habits and anatomy of *Opisthocomus cristatus*, by Dr. C. G. Young. In this paper there are no references to the various memoirs already published on the anatomy of this bird.—On some new or little-known Longicorns (Pachyteria), by C. Ritsema.—On birds from the Congo and South-Western Africa, F. Büttikofer.

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Revue d'Anthropologie, troisième série, tome iii. troisième fasc. (Paris, 1888).—Report on the excavations made in the bed of the Liane in 1887 in laying the foundations for a viaduct, by Dr. E. T. Hamy. The mouth of this river, which is now filled with alluvial deposits, was in earlier times a vast estuary opening into the Channel; and in the recently completed excavations there has been found a mingled mass of animal bones, with metal and pottery fragments, belonging to all historic ages, from Roman times to our own, while the deep underlying strata recall, in their general character and appearance, Quaternary formations. Besides these remains, several pieces of a human skeleton have been found, including the cranium, which is considered by M. Hamy and other anatomists as belonging, in regard to its essential characteristics, to the oldest Quaternary cranial type. A slight degree of prognathism is the only feature of inferiority which it presents, and it in no way resembles the Negro or Negroid form. The remarkable elongation of all the bony parts in a vertical direction may be regarded as the special peculiarity of this skull, of which M. Hamy gives numerous measurements, based on the system adopted in the *Crania Ethnica*.—Continuation of an essay on the stratigraphic palæontology of man, by M. Marcellin Boule. The larger portion of this paper treats of the actual condition of palæontological research in England, and describes at length the numerous directions in which light has been thrown by recent British geologists on the effect of glacial action in determining the character and forms of the predominant geological features of the British Isles. The writer gives unqualified praise to the labours of Ramsay, Geikie, and others, lamenting, however, that in regard to numerous important points the views of the leading English palæontologists present great divergencies. In the second part of his essay M. Boule passes in review the results obtained by recent investigations of the traces existing in the Alps of recurring and intermittent glacial periods. In this inquiry he has made special use of Herr Penck's great work, "Mensch und Eiszeit" (1884), in which the strongest evidence is brought forward in proof of more than one advance and retrogression of glaciers in the valley of the Iller, and at other points of the Alpine range. These views have been confirmed by M. Blaas, and quite recently (1887) by M. Baltzer, and with few exceptions they have been generally adopted by Continental geologists; M. Falsan, Prof. Favre, of Geneva, and one or two others alone refusing to renounce the theory of one sole glacial period, while, however, they admit the possibility of the oldest glaciers having experienced more or less prolonged phases of advance and retreat.—The latest stages of the genealogy of man, by M. Topinard. This paper embodies the concluding and most important of the lectures delivered by the Professor at the Paris School of Anthropology. Beginning with the Lemuridæ, he treats of the grounds on which this animal family has been included by some, as Cuvier, under the Quadrumana, while Linnæus, Huxley, Broca, &c., class them with the Primates. To the latter view M. Topinard adheres, while he agrees generally with Prof. Huxley in including three groups under the Primates, viz. man, the Simians, and the Lemurians, the second group being separated into numerous divisions and subdivisions. M. Topinard's paper is interesting as a full and unbiassed exposition of the various hypotheses advanced by the leaders of modern biological inquiry as to the descent of man. While he freely expresses his personal aversion to the views of Vogt, which evidently point to the Ungulata as supplying the point of departure from which the primary source of man's descent emanated, he does ample justice to the great value of his labours, and acknowledges the benefit which he has derived from following the paths of inquiry inaugurated by the daring German physicist. Having minutely described the various anatomical characteristics which are common to man and to different mammalian families, he gives his reasons for believing that our descent is derived from the Simiadæ through a long series of intermediate forms of more or less strongly-marked anthropomorphic character, dating back to the Miocene age, when a divergence from the common type may have appeared, which, widening in the course of countless ages, has resulted in developing in man the perfect brain, and the maximum of differentiation in the extremities which give him his place in Nature.—On palæontology in Austria-Hungary, by M. M. Hörnes. The study of the prehistoric remains of their country is of recent date among Austrians, since the Anthropological Society of Vienna, the only one as yet incorporated by them, owes its origin to Rokitansky, and was only founded in 1870. Since that period, however, highly important results have been obtained from carefully conducted explorations in Carinthia and Carniola, where the discovery of vast burying-grounds and lacustrine stations has thrown much light on the condition and degree of civilization of primæval man in South-Eastern Germany. In Lower Austria almost all isolated hills and mountains present evidence of Neolithic occupation, many of them still retaining megalithic remains. Dr. Hörnes's article is especially interesting as showing what extensive, still almost untrodden tracts are being opened to palæontologists in different parts of the Slavonian and Czeck provinces of Austria; while his summary of the results already achieved, and his remarks on the ethnographic character of the primitive peoples by whom these regions were occupied in prehistoric times, throw considerable light on a hitherto obscure department of European palæontology.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 7.—"Note on some of the Motor Functions of certain Cranial Nerves (V, VII, IX, X, XI, XII), and of the three first Cervical Nerves, in the Monkey (*Macacus sinicus*)." By Charles E. Beevor, M.D., F.R.C.P., and Victor Horsley, B.S., F.R.S. (From the Laboratory of the Brown Institution.)

In the course of an investigation which we are making into the cortical representation of the muscles of the mouth and throat, we have experienced considerable difficulty in describing correctly the movements of these parts, especially when there was any question of bilateral action occurring.

On referring to text-books we failed to find any solution of this difficulty, and we therefore determined to make a few observations of the movements evoked by stimulating the several cranial nerves supplying this region in the monkey,[1] so as to have a definite basis whereon to ground our observations of the movements obtained by stimulating the cortex.

In the course of this work we have observed several facts which do not harmonize with the views hitherto generally received.

The results are summarized as follows:—

Method of Investigation.

The conclusions we have arrived at are based almost entirely upon the results obtained by exciting the respective nerves at the base of the cranial cavity after separating them from the bulb.

We have also stimulated the nerves outside the skull in the neck both before and after division.

In every case the animal was narcotized with ether. In all we have done eight experiments, and in every case we have operated on the same kind of monkey, *i.e. Macacus sinicus*.

The nerves were in each case raised up from their position and stimulated in the air by a faradic current through fine platinum electrodes, the area of the operation having been gently dried.

The current employed was from the secondary coil of an ordinary du Bois-Reymond inductorium, supplied by a 1 litre bichromate cell. The experiment was carefully begun with the secondary coil at a distance of 30 cm. from the primary, this interval being very rarely diminished to more than 15 cm. (zero being of course the point where the secondary coil completely overlaps the primary).

Further Observations respecting the Examination of each Nerve.

A. *Cranial Division.*

Vth Nerve.—Excitation of the motor root of the trigeminus evoked powerful closure of the jaws, and although the muscles of one side only were in action, the teeth were approximated without any lateral deviation of the lower jaw.

VIIth Nerve.—The motor distribution of the facial nerve has for the most part been well known for some time. However, we consider that, unfortunately, a very fundamental error respecting this distribution has crept into the text-books, it being supported by one anatomical authority following another, and, moreover, having been accepted by clinicians as an important aid in the differential diagnosis of facial paralysis. We refer to the supposed supply of motor fibres from the facial to the levator palati through the superficial petrosal nerve.

This idea,[2] upon which so much stress has been laid, is

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[1] Previous observers having employed animals of lower orders.

[2] Without definitely supporting this view, Gaskell (Roy. Soc. Proc., vol. xliii. p. 390) shows that some large "somatic" nerve-fibres leave the facial nerve between its origin from the bulb and its exit from the stylo-mastoid foramen. He suggests that some of them may possibly form a nerve to supply the levator palati, but he leaves their real destination undetermined.

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